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Environmental, Economic and Social Values of the Lower South East Marine Park

PART 1

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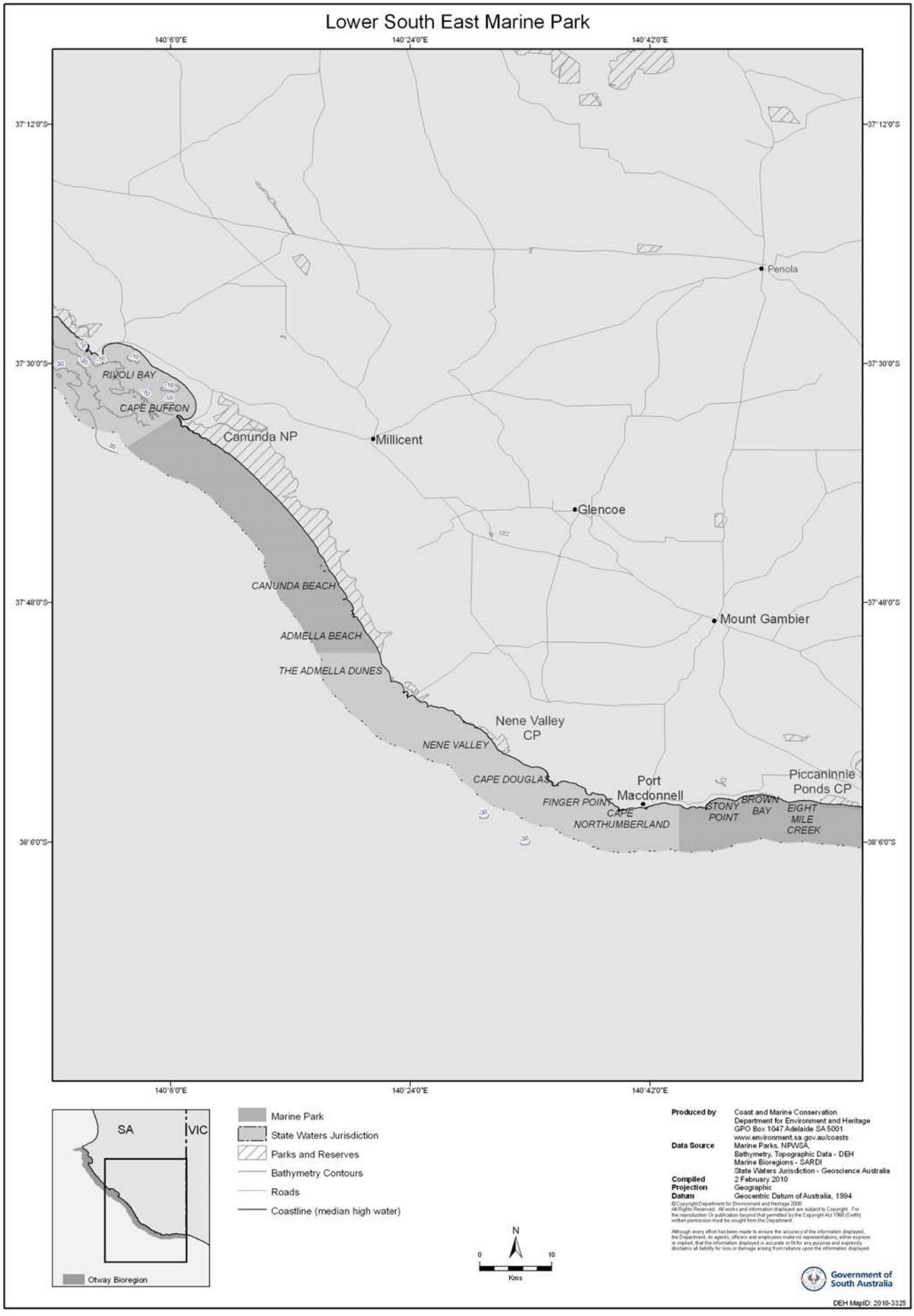
An atlas of maps containing environmental, economic and social/cultural information for this marine park has been produced as Part 2 of the Values Statement. The maps provide details specific to this park in a user-friendly visual format and may be viewed and downloaded from http://www.marineparks.sa.gov.au.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Penola
RIVOLI BAY
CAPE BUFFON
Canunda NP
Millicent
Glencoe
CANUNDA BEACH
ADMELLA BEACH
THE ADMELLA DUNES
Mount Gambier
Nene Valley CP
NENE VALLEY
CAPE DOUGLAS
FINGER POINT
CAPE NORTHUMBERLAND
Port Macdonnell
STONY POINT
BROWN BAY
Piccaninnie Ponds CP
EIGHT MILE CREEK
SA
VIC
Otway Bioregion
Marine Park
State Waters Jurisdiction
Parks and Reserves
Bathymetry Contours
Roads
Coastline (median high water)
N
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Kms
Produced by Coast and Marine Conservation
Department for Environment and Heritage
GPO Box 1047 Adelaide SA 5001
www.environment.sa.gov.au/coasts
Data Source Marine Parks, NPWSA
Bathymetry, Topographic Data - DEH
Marine Bioregions - SARDI
State Waters Jurisdiction - Geoscience Australia
Compiled 2 February 2010
Projection Geographic
Datum Geocentric Datum of Australia, 1994
Government of South Australia
DEH MapID: 2010-3325

Lower South East Marine Park

Located in the Otway Bioregion, the Lower South East Marine Park covers 360 km^2 and is divided into two sections: the first adjacent to Canunda National Park and the second extending from Port MacDonnell Bay just west of French Point to the Victorian border. This marine park borders Canunda National Park and partially overlays Piccaninnie Ponds Conservation Park. The sand dunes at Brown Bay are also included within the park.

1 Environmental values

1.1 Ecosystem services

Ecosystems provide many critically important services that people benefit from, often at no direct cost to us. Examples of ecosystem services provided by coastal and marine habitats are shown in the following table. It is important to ensure that ecosystem health and integrity are maintained so that ecosystems continue to provide these services to us all.

Table adapted from McLeod, K and Leslie, H (2009).

	Life supporting services				Resources and products				Maintain earth's living space							Recreational and cultural services				
Coastal, estuarine and marine habitat types	Biogeochemical processes	Biophysical processes	Biodiversity	Nutrient cycling	Food	Fibre, fuel, shells etc	Non-biological materials (eg minerals)	Pharmaceuticals & nutriceuticals	Climate regulation	Waste processing	Flood/storm protection	Water flow/ circulation	Erosion control	Water quality	Sediment quality	Cultural and amenity	Recreation and tourism	Aesthetics	Spiritual, religious, lifestyle	Education and research
Bare sand	x	x	x	x	x	x	x			x		x		x	x	x	x	x	x	x
Reef (granite, limestone, calcarenite or low profile platform reef)	x	x	x	x	x	x	x	x	x	x		x	x	x		x	x	x	x	x
Water column	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
Cliffs	x	x	x	x	x	x	x				x					x	x	x	x	x
Sandy beaches (dunes, coarse sand, fine sand)	x	x	x	x	x	x	x			x		x			x	x	x	x	x	x
Other beaches (boulder, pebble/cobble, mixed)	x	x	x	x	x	x	x			x		x	x		x	x	x	x	x	x

The Lower South East Marine Park will be designed to conserve examples of the variety of habitats and species found in the Otway Bioregion. Habitats, species and natural processes found here are summarised below.

1.2 Physical influences

Physical influences shape the type of habitats and species found in an area. Physical influences typical of this region include:

- average sea surface temperatures ranging from 14°C in winter to 18°C in summer, but decreasing to 11 – 12°C in summer due to the influence of the upwellings;
- salinity averages around 35ppt;
- the cooler Flinders Current[1] in summer;
- the nutrient rich Bonney upwelling from December to May;
- high wave and wind energy;
- fresh water inputs from springs and lakes;
- micro-tidal tides ranging from 0.05 to 1.1 m;
- exposure to waves from the west, south west, south and south east.

1.3 Habitat variety

Table 1 Benthic (subtidal) habitats found in the Lower South East Marine Park

Benthic Habitat**	Area (km²)*	% of park
Bare sand	42	12%
Heavy limestone reef	9	3%
Low profile platform reef	99	27%
Unmapped	210	58%

* habitat areas have been rounded to the nearest whole number
**habitats included are those found from mapping at a resolution of 1:100,000

Table 2 Shoreline (intertidal) habitats found in the Lower South East Marine Park

Shoreline Habitat	Length in park (km)*	% of park length
Cliffs	11	16%
Fine sandy beach	54	78%
Mixed beach	4	6%

* habitat lengths have been rounded to the nearest whole number

The Lower South East Marine Park includes exposed, high energy sand beaches such as Canunda Beach, pocket beaches, freshwater springs, rocky headlands with shore platforms and fringing reefs, and extensive offshore limestone low platform reef structures interspersed by sandy seafloor habitats.

The region is dominated by flat limestone reefs scattered with sand patches, and kelp forests coupled with algal communities beneath them. Reefs extend out to waters more than 60 m deep. The extensive limestone reefs and nutrient-rich water create an area noted for its high species diversity and endemism.

There are no true rivers in this region except for a few groundwater fed creeks and two unconfined aquifers that discharge freshwater at the coast via beach springs. Spring lakes such as Ewen Ponds and Piccaninnie Ponds (both Wetlands of National Importance) emerge from the beaches and are unusual in South Australia. They support the presence of a number of estuarine fish such as congolli or fish that have both marine and freshwater stages including the *vulnerable* Australian grayling.

1.3.1 Cape Buffon to Admella Beach

This section of the coast faces the full force of the wind and waves off the Southern Ocean having no sheltered bays. Habitats along this section of the park include the cliffs, pocket beaches and

[1] The Flinders Current is a deep south-east to west current which is thought to flow from the west Tasmanian shelf to Cape Leeuwin and increases in flow speed from south-east (5cm / second) to west (20cm / second). (Middleton & Bye 2007).

long sandy beach and dune complex of Canunda Beach, interspersed by rocky outcrops, intertidal and shallow near-shore reefs, patches of algal beds and sandy plains.

The leeward side of offshore reefs provide protection for a large range of algae, rock lobster and fish species.

1.3.2 French Point to Victorian border

Extending from French Point east of Port MacDonnell is a patch of sandy seafloor which transitions to a low profile platform reef extending to the east side of Stony Point. East of Stony Point, the remaining coast, to the Victorian border, is an extensive stretch of sandy seafloor with scattered patches of low profile platform reef. The gently sloping sand and reef systems are home to a diversity of invertebrate burrowing animals.

1.4 Marine species

The many habitats located within the Lower South East Marine Park support a variety of marine and coastal species including fish, sharks, mammals, birds and invertebrates, some of which have been identified as ecologically important. Refer to Appendix 1 for a more detailed list of species. The Lower South East Marine Park features:

- Giant and bull kelps;
- Southern rock lobster; and
- Pygmy blue whale during December to May.

1.4.1 Plants and algae

The region has a high diversity of red and green algal species many of which are thought to be rare or uncommon. Reef that occurs at 15-40m contains an abundant species of red algal communities, which forms a habitat for rare and unique fish species. Some areas of the lower South East contain the rare green algae *Palmaclathris* sp. which can form extensive beds.

The kelp forests found in this region indicate a stronger ecological linkage with waters of Victoria and Tasmania than with South Australia. The forests are dominated by giant kelp, which occurs from about 13 to 22 m deep, and can grow up to 30 m tall. Giant kelp (*Macrocystis*) and its associated communities occur throughout the area between Cape Douglas and the Victorian border.

Another large plant, bull kelp, is found in the intertidal and shallow subtidal on wave-exposed coasts. The shady sea floor beneath the kelp provides ideal conditions for many species of red algae. This is an important food source for grazing snails such as abalone and pheasant shells.

1.4.2 Bony fish, sharks and rays

The algal and sandy environments provide habitats for a range of species including King George whiting, Western Australian salmon, eastern Australian salmon, Australian herring (tommy ruffs), southern garfish, flathead species, trevally, leatherjacket species, snook, yellow-eye mullet, red mullet, flounder and mulloway.

The shortfin mako and porbeagle are known to visit locations throughout the park and were recently listed for protection under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The dusky whaler has been nominated for protection under the EPBC Act and can be found in the park. Other shark species of conservation concern recorded in the area include coastal stingaree, whitespotted spurdog, spotted wobbygong, blue shark, smooth hammerhead and school shark as well as the nationally *vulnerable* white shark.

Connected to the marine park are Eight Mile Creek and Ellards Creek that drain fresh water from Ewens and Piccaninnie Ponds respectively. Both sites provide habitat for several threatened or potentially threatened species that require freshwater and marine environments during their lifecycle. Species include the pouched lamprey, short-headed lamprey and short-finned eel. Other more typically marine species that use this freshwater habitat during parts of their lifecycle include the yellow-eye mullet and black bream.

1.4.3 Marine mammals

Nationally and state listed *endangered* blue whales are sighted in relatively large numbers in the Bonney upwelling between December and May. An aggregation site is reported to be at a shelf break in deeper Commonwealth waters mainly between Port MacDonnell and Warrnambool.

There are other rare sightings of marine mammals which are either lost or forced from their normal migratory path such as the state *rare* Australian fur seal, southern elephant seal, leopard seal and Cuvier's beaked whale as well as the long-finned pilot whale. All cetacean species are nationally protected.

1.4.4 Seabirds and local and migratory shorebirds

Located throughout the marine park are many important sites for local and migratory shorebirds, as well as seabirds. Of particular importance is Piccaninnie Ponds, which is partially located in the marine park. The site is recognised as internationally important for many species of local and migratory shorebirds protected under international treaties. Tidal flats in the area provide important roosting, breeding and feeding sites for seabirds and migratory and non-migratory wader and shorebirds.

Wader birds are found on the sandy beaches and intertidal areas feeding on the great diversity of animals living there. For example, the state *vulnerable* hooded plover feeds and nests seasonally on the beaches of Canunda National Park. Other threatened species that are known to visit this area include the state *endangered* fairy tern and the state *rare* ruddy turnstone. A colony of little penguins is located at Cape Northumberland. At least six albatross species, as well as the giant petrel, can be found offshore along the coast. Examples include the state *vulnerable* shy, light-mantled, black-browed, wandering and royal albatrosses.

1.4.5 Marine invertebrates

The limestone reefs and kelp forests of the south-east are ideal habitat for the southern rock lobster because limestone erodes easily, thereby providing numerous ledges, crevices and undercuts which are ideal habitat for lobster. These reefs also provide micro-habitats for other animals such as sponges, molluscs and ascidians. Sea urchins which live amongst and feed upon the kelp are a favoured food of the southern rock lobster.

Large numbers of animal communities including molluscs and crustaceans can be found within the kelp forests including sea urchins, blacklip and greenlip abalone. Endemic and uncommon species of ascidians and sponges can also be found, particularly in shallow waters to about 13 m depth. The many rocky pools and crevices, along the coast, contain sea stars, gastropods, anemones, calamari and the Maori octopus.

For further environmental and social information refer to http://www.marineparks.sa.gov.au

2 ECONOMIC VALUES

The marine environment is an important source of wealth for South Australia and its coastal communities. Marine parks will be designed to accommodate existing economic activities wherever possible. The main economic activities in the Lower South East Marine Park are summarised below. Information in the Commercial fishing, and Mineral and energy resources sections has been provided by PIRSA.

2.1 Commercial fishing

The commercial fisheries that operate in the Lower South East Marine Park are the:

- Southern Zone Abalone Fishery;
- Southern Zone Rock Lobster Fishery;
- Marine Scalefish Fishery; and
- Miscellaneous Giant Crab Fishery.

The value of each of these fisheries, including the direct and flow-on values, as well as the number of employees and export values, where available, are listed below. Note that the values provided below are for the entire area of the fishery and may not be specific to the Lower South East Marine Park.

Table 3. The 2008/09 economic value of fisheries operating in the marine park for relevant fishery areas (figures are not specific to the park area and include catches from outside the marine park boundary).

	Catch value($m)	Value of flow-on to other sectors ($m)	Fishing (FTE) employment	Flow-on (FTE) employment
Abalone (State)	30	45.2	90	225
Abalone (Southern Zone)	4.8			
Southern Zone Rock lobster (South East)	85.4	49.3	414	285
Marine Scalefish#	22.6	50.8	526	248

EconSearch 2010 a, b and c.
State figures have been used as there were no figures available specifically for the South East.

These fisheries are important to regional economies of the area both directly, through employment in each fishery, and indirectly, through a range of additional services such as processing, local transport, marketing, local retail and food services. Each of these activities generates flow-on effects to other sectors, through purchases of inputs and employment of labour.

The abalone fishery targets greenlip abalone and blacklip abalone. The park lies within the Southern Zone Abalone Fishery which produced approximately 18% of the total state harvest in 2008/09. Most of the catch is blacklip abalone.

The Southern Zone Rock Lobster Fishery is the highest value fishery in the State directly contributing $85.4 million in 2008/09. In 2007/08 the southern zone accounted for approximately 37% of the total wild fisheries value for South Australia. The fishery is divided into a number of Marine Fishing Areas (MFAs) with 2 of the MFAs covering the waters of the park. These MFAs account for a significant proportion of the Southern Zone catch.

The Marine Scalefish Fishery is a diverse multi-species, multi-gear fishery that operates across State waters, targeting four key species: snapper, King George whiting, southern garfish and southern calamari.

The Giant Crab Fishery is a small fishery with well established operators who fish in the area. The average catch in South Australia is 20t per year.

Fishing charters also operate from a number of locations throughout this region.

For further information or to view maps of the fishing regions visit:
http://www.sardi.sa.gov.au/__data/assets/pdf_file/0010/99739/No_305_South_Australian_Wild_Fisheries_Information__and__Stats_report_200708_published.pdf

2.2 Mineral and energy resources

Currently, offshore South Australia is only lightly explored for oil and gas and no economic discoveries have been made; however, potential exists in the marine park for petroleum accumulations and access is needed for seismic surveying to delineate prospects. Potential also exists further offshore on the continental shelf and slope where recognised exploration targets are similar to those in prolific gas–oil provinces elsewhere in the world. Such discoveries may require access for landing pipeline infrastructure onshore.

The potential for offshore geothermal energy resources has not yet been addressed, however potential exists to utilise geothermal energy in adjacent coastal or inland water settings for a variety of purposes, including power for desalination plants.

There are two Extractive Mining Leases partially covering the park near Carpenters Rocks for silica extraction. There are three Petroleum Exploration Licences adjacent to this marine park located inshore from the coast while Exploration Petroleum Permit 34 lies adjacent to the northern part of the park in Commonwealth waters.

2.3 Transport and infrastructure

Transport and infrastructure provide an important economic contribution to the region, providing for maritime activities such as: shipping ports for import and export of goods; boat ramps for launching of recreation or commercial vessels; jetties for fishing; and breakwaters and groynes for coastal management.

2.4 Local tourism

Tourism is a major economic activity and the coastal and marine environment is an important part of the tourism experience throughout this region. Adelaide residents and interstate visitors are drawn to the beautiful, open beaches of the region. Activities enjoyed by tourists in this region include camping, fishing, sampling the produce of the region and visiting coastal conservation parks. Other drawcards include the use of charter boats for diving and recreational fishing.

On average the Wattle Range Council area receives about 66,000 domestic overnight visitors a year who stay for 202,000 nights, as well as about 121,000 day visitors annually. Together, they spend about $28m in the region. Tourism provided an important employment opportunity for the district, with 240 businesses in 2007 involved in, or reliant on, tourism.

3 SOCIAL VALUES

The marine environment is an important recreational asset for coastal communities. Marine parks will be designed to accommodate existing recreational activities wherever possible. This section highlights the social values of Lower South East Marine Park and is separated into four parts:

- Aboriginal and European cultural heritage;
- scenic values;
- recreational activities and popular locations; and
- interpretive and educational opportunities.

3.1 Aboriginal heritage

Aboriginal people have interacted with the marine environment for thousands of years and their relationships with the sea remain strong through customs, laws and traditions. Traditional usage, Aboriginal cultural heritage, Indigenous Protected Areas (IPAs), Indigenous Land Use Agreements (ILUAs) and Native Title considerations will be taken into account in developing the management plan for the Lower South East Marine Park.

3.1.1 Language groups

The Buandig Aboriginal people have traditional associations with areas of the marine park including estuarine and coastal environments which provide food and resources for local Aboriginal people and still hold strong cultural significance today.

3.1.2 Agreements and claims

There are currently no Native Title Claims or registered ILUAs included in the marine park.

3.1.3 Sites and stories

The Buandig people have a distinctive language and customs which are depicted in well known creation stories such as Craitbul, a giant ancestor who created many of the geological features of the area known today as Mount Muirhead, Mount Schank and Mount Gambier.

The Government is aware that there may be confidential Aboriginal heritage sites in South Australia's coastal areas. Where possible, these sites have been considered in the planning process. Future management plans will ensure these heritage sites are appropriately respected.

3.2 European heritage

Where possible, the management plan for the Lower South East Marine Park will recognise and complement sites of cultural and maritime heritage.

From the early years of settlement, the lower South East coast of South Australia was passed by any vessels trading between Adelaide and the eastern states. Many ships were wrecked along this coastline and a number of them are located within the marine park.

The largest of these ships was the *Geltwood*, which is believed to have been driven onto a reef during a violent storm in 1876. Other protected wrecks within the park include the *Varoon* (1856), the brigantine *Adelaide* (1861) and the schooner *Orwell* (1873). The stories of these and other wrecks have been told in the Southern Ocean Shipwreck Trail.

The Canunda National Park, and the Piccaninnie Ponds Conservation Park, which are either adjacent to or partially within the marine park are included in the Register of the National Estate.

Lcoated adjacent to the park, the coastline from Kingston to the Piccaninnie Ponds Conservation Park is recognised as a Geological Monument for a variety of coastal formations and dune features.

3.3 Scenic values

The scenic quality of South Australia's coast is a significant social, economic and environmental resource. The coastline has high amenity value and includes high quality landscapes, also known as viewscapes. The significance or quality of viewscapes is derived from a combination of landform (relative relief, variety and complexity of landscapes), land cover (nature, scale and variety of vegetation), land use (impact of human activity), water, diversity, naturalism and colour.

The coastline of the Lower South East Marine Park has moderate-high scenic values (Lothian 2005). The short section of fragmented rocky coast of low headlands, reefs, small islands and small bays from McIntyre Beach to South End, is among the highest ranked areas of coastal scenic quality in the State. South of this section the long curved beach flanking the Canunda National Park, broken only by three small rocky headlands at Number 2 Rocks, also has high scenic qualities. Of less scenic value are the beaches and dunes between French Point and the Victorian border.

Scenic values of coastline in the Lower South East Marine Park (Lothian 2005).

Rating	Coastal landform type	Ranking
6.75 – 8.0	Headlands and bays	High
6.75 – 7.25	Dunes and beach (Geltwood Beach to Admella Beach)	High
6.5 – 7.0	Dunes and beach (Victorian border to French Point)	Moderate

For further information on coastal scenic values and viewscapes refer to http://www.environment.sa.gov.au/coasts/management/coastal-viewscapes.html

3.4 Recreational activities in the marine park

The coastal and marine environments of the Lower South East Marine Park are very popular with recreational fishers, boat users, swimmers, surfers and sightseers. The locations of some of these activities are listed below.

3.4.1 Recreational beach and boat fishing locations

Recreational fishing is a popular past time in South Australia. Recreational fishers collectively harvest significant proportions of the total catch for a number of key species. The total number of recreational fishers for the Lower South East (region 24 and 25) during 07/08 was 7,959 which amounted to 42,508 days of fishing. (Note figures relate to regions used for reporting fishing

activities and include catches from outside the marine park boundary). Rock lobster, southern garfish and King George whiting were the most frequently caught species for the South East region.

Recreational beach fishing is popular at Canunda and Admella beaches, Riddoch, Brown and Discovery Bay beaches and near Southend, to name a few. Recreational fishing from a boat occurs at many sites throughout the region, with access via the boat ramps and beach launching sites scattered throughout the park, such as at Dangerous Point, Orwells Rocks and Stony and Green Points.

3.4.2 Popular surfing and swimming beaches

Canunda and Brown Bay beaches are regularly visited by surfers. Riddoch Bay beach and Canunda beach are some of the areas enjoyed for swimming.

3.4.3 Other recreational activities in the park

Camping facilities are located adjacent to the marine park within Canunda National Park. Four-wheel driving along the coast is also a popular activity.

3.5 Interpretive and educational locations within the marine park

This region is part of the Southern Ocean Shipwreck Trail, which extends from the Victorian border to the Murray Mouth. Interpretive signs are located along the trail.

APPENDIX 1 SPECIES LIST

This list of some of the species identified in the Lower South East Marine Park indicates the diversity of species found there.

Plants and algae

bull kelp	*Durvillaea potatorum*
giant kelp	*Macrocystis angustifolia*
kelp	*Ecklonia radiata*

Bony fish, sharks and rays

Australian grayling	*Prototroctes maraena*
Australian herring	*Arripis georgianus*
black bream	*Acanthopagrus butcheri*
black ray	*Dasyatis thetidis*
blue shark	*Prionace glauca*
coastal stingaree	*Urolophus orarius*
congolli	*Pseudophritis urivilli*
dusky whaler	*Carcharhinus obscurus*
eastern Australian salmon	*Arripis trutta*
flathead	*Platycephalus bassensis*
flounder	*Ammootretis lituratus*
King George whiting	*Sillaginodes punctata*
leatherjacket	Monacanthidae
mulloway	*Argyrosomus japonicus*
porbeagle	*Lamna nasus*
pouched lamprey	*Geotria australis*
red mullet	*Upeneichthys vlamingii*
school shark	*Galeorhinus galeus*
shortfin mako	*Isurus oxyrinchus*
short-finned eel	*Anguilla australis*
short-headed lamprey	*Mordacia mordax*
smooth hammerhead	*Sphyrna zygaena*
snapper	*Pagrus auratus*
snook	*Sphyraena novaehollandiae*
southern garfish	*Hyporhamphus melanochir*
spotted wobbygong	*Orectolobus maculatus*
trevally	*Pseudocaranx georgianus*
Western Australian salmon	*Arripis truttaceus*
white shark	*Carcharadon carcharias*
whitespotted spurdog	*Squalus acanthias*
yellow-eye mullet	*Aldrichetta forsteri*

Marine mammals

Australian fur seal	*Arctocephalus pusillus doriferus*
blue whale	*Balaenoptera musculus*
leopard seal	*Hydrurga leptonyx*
long-finned pilot whale	*Globicephala melas*
southern elephant seal	*Mirounga leonina*

Seabirds and local and migratory shorebirds

black-browed albatross	*Thalassarche melanopris*
fairy tern	*Sterna nereis*
giant petrel	*Macronectes* spp.
hooded plover	*Thinornis rubricollis*
light-mantled albatross	*Phoebetria palpebrata*
little penguin	*Eudyptula minor*

royal albatross	*Diomedea epomophora epomophora*
ruddy turnstone	*Arenaria interpres*
shy albatross	*Thalassarche cauta*
wandering albatross	*Diomedea exulans (sensu lato)*

Marine invertebrates

anemones	Actinaria
ascidian	Ascidiacea
blacklip abalone	*Haliotis rubra*
calamari	*Sepioteuthis australis*
gastropods	Gastropoda
giant crab	*Pseudocarcinus gigas*
greenlip abalone	*Haliotis laevigata*
Maori octopus	*Octopus maorum*
pheasant shell	*Phasianella australis*
sea star	Asteroidea
sea urchin	Echinoidea
southern calamari	*Sphyraena novaehollandiae*
southern rock lobster	*Jasus edwardsii*
sponge	Porifera

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